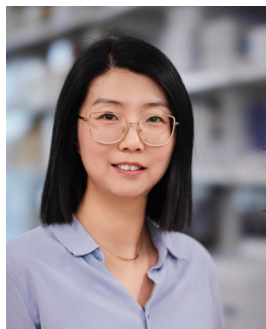




DEVELOPMENT OF A NASAL SPRAY FOR RESPIRATORY VIRUS PROPHYLAXIS: FROM BENCHTOP TO MARKET



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ABSTRACT

Respiratory viruses such as SARS-CoV-2, influenza, and respiratory syncytial virus (RSV) cause significant global morbidity and mortality. Current prophylactic measures, including vaccines, antibodies, and antiviral drugs, have helped reduce the threat posed by respiratory viruses. However, vaccines are often virus-specific, requiring frequent updates to address mutations. Antibodies and antiviral drugs face issues related to specificity and side effects. In response to these challenges, we have developed N-dihydroGalactoChitosan (GC), a novel biosynthetic polysaccharide with excellent safety profile and potent immunostimulatory activities. GC, already FDA-approved for cancer clinical trials, has demonstrated strong potential as a prophylactic agent when administered intranasally (i.n.). In our preclinical study, i.n. GC reduced morbidity and mortality by 75% in hACE2-transgenic mice challenged with lethal SARS-CoV-2 infection. We aim to develop GC into a nasal spray for broad-spectrum protection against respiratory pathogens, providing essential scientific evidence to translate GC into a safe, self-applied, home-based prophylactic clinical product.

BIO

Dr. Lin Wang earned her Ph.D. in Chemistry and Biochemistry from the University of Oklahoma and is currently a Research Assistant Professor in the Stephenson School of Biomedical Engineering. Her background spans nano/biomaterials, material-bio interactions, drug delivery, tumor targeting, and immunotherapy, leading to more than 25 publications in high-impact journals with over 1,300 citations. Her current research focuses on the development of a novel synthetic biopolymer, N-dihydrogalactochitosan (GC), into an intranasal spray, including characterization of spray performance and deposition, evaluation of immunostimulatory activity, and investigation of prophylactic efficacy against respiratory viral infections, along with comprehensive safety profiling. In addition, she leads translational efforts to advance GC toward a clinical product, overseeing prototype design, formulation development, human-use spray devices, future translational animal studies, and coordination of regulatory affairs.